
BOOK REVIEWS

Structural Brickwork

Reviewed by J. Gregg Borchelt, Executive Director, Masonry Institute of Houston-Galveston, Houston, TX; member of ASTM.

REFERENCE: Hendry, A. W., *Structural Brickwork*. Halsted Press, John Wiley & Sons, Inc., New York, 1981, 209 pp., \$49.95.

A review of the existing knowledge of the structural engineering aspects of brick masonry construction is provided in this work by Hendry. Individual materials, separate structural elements, and the entire structure are considered. This book contains a summation of current research, often with two or more proposed design approaches presented, and a comparison to test results. Recommendations for future research are listed if sufficient data are not now available for analysis.

The book opens with a discussion of the design philosophy of loadbearing brick buildings. Included in this first chapter is a section on limit states design. The progression through the text is from material components to assemblages to walls and then to walls as part of the structure. The theoretical background and the effect of assumptions for a rational design approach of various design methods are covered.

The second chapter, the strength of brickwork, is an excellent treatise dealing with effect of variables on the physical properties of the resulting assemblage. This chapter should be mandatory reading for engineers, architects, inspectors, and laboratory personnel designing, sampling, or testing brick masonry construction.

The bulk of the material addresses unreinforced masonry. Reinforced and prestressed brickwork are covered in a single chapter. Virtually all structural elements are covered: loadbearing walls, reinforced beams, shear walls, and laterally loaded walls. Theoretical design criteria for compression, combined compression and bending, and lateral load are compared to experimental test results. Progressive collapse of bearing wall structures is investigated under the topic of accidental damage. The action of brick masonry walls with beams and frames of other structural materials is found in the last chapter.

Sketches and photos of typical failure patterns are presented. Only analysis of brick masonry is provided although some tests of concrete masonry are included. There are no construction details present although research referenced includes wall/floor or wall/beam connections.

There are several drawbacks, however. There is a slight variation in terminology between Great Britain and the United States, for example, leaf for wythe and lift for elevator. Reference is made to the British Code of Practice for Structural Use of Masonry (BS 5628), which is unfamiliar to most U.S. designers. Metric units are used throughout, with no conversion to inch-pound units.

Research results are taken from several sources and interpretation is sometimes difficult since all of the pertinent information is not contained in this text. Additionally, notation varies from report to report and the reader must determine the notation used in different parts of the text. A summary of notation used or consistent notation throughout would be helpful. A large number of constants for analysis of research data and design are derived, and thus the changing notation is more critical.

All page references in the Table of Contents are not correct. The Subject Index refers to the proper pages but could have been more inclusive. The Author Index omits the last names beginning with H, O, P, and R. Also, no authors with last names beginning with N or Q are in the Author Index and none were noted in the references following each chapter.

The drawbacks are minor when compared to the quality of the information presented. This book belongs in the library of anyone working with masonry.

Food Chemicals Codex

Reviewed by Robert C. Gelardi, International Food Additives Council, Atlanta, GA.

REFERENCE: Committee on Codex Specifications, *Food Chemicals Codex*, 3rd Edition, National Academy of Sciences, Washington, DC, 1981, Publication Code ISBN 0-309-0309-0, 745 pp., clothbound \$45.00 (including supplements).

This impressive 1981 revision of the *Food Chemicals Codex* (FCC) is a timely and worthy successor to the previous editions published in 1966 and 1972. While the aim of the Codex Committee, that is, to develop food-grade specifications for ingredients used as food additives, has remained unchanged since the inception of the project in 1961, the scope of each succeeding FCC edition has expanded, not only in terms of the types and number of additives covered, but also in the sophistication of the analytical methodology used for determining compliance with the specifications.

The design and format of FCC III are substantially different from the first two editions. The larger page size and two-column format are the most obvious physical changes, but the contents of the monographs also have been reorganized to more clearly indicate those portions of the specifications that constitute requirements. Specifications for some 400 flavor aromatic chemicals and isolates have been transferred from the general monographs section of the book to a separate tabular section where the various physical constants, other properties, and requirements can be readily compared. The addition of 113 completely new monographs, plus 28 monographs included in the three supplements to FCC II, brings to 776 the total covered by this edition. Because of the grouping of some substances into family monographs (for example, Enzyme Preparations and Spice Oleoresins), the total number of specifications exceeds 800.

A typical monograph contains the following major sections:

Description—(physical form, odor, taste, solubility, and so forth),

Requirements—(identification; assay; limits for arsenic, heavy metals, lead, and so forth; permissible ranges for such parameters as specific rotation, refractive index, and specific gravity; and limits for characteristic impurities and byproducts), and

Tests—(analytical procedures for determining the Requirements), together with statements on the function of the additive in foods and suggestions for packaging and storage.

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Many of the analytical procedures are included within the individual monographs, but more than 100 general methods are provided in a separate section of the book, as in former editions. Although many of the test methods are still of the traditional wet-chemical type, the new FCC uses a number of chromatographic procedures and other instrumental methods. A new feature for this edition is the inclusion of approximately 400 infrared spectra used as identification tests, primarily for the essential oils and flavor aromatics.

Other new features of this volume are descriptive sections on the general operating procedures of the Food Chemicals Codex, and on general good manufacturing practice guidelines for food chemicals, in addition to an extensive compilation listing the names of the more than 600 individuals who participated in the development of FCC III. This edition also includes a flexible added substance provision permitting the addition of secondary ingredients, subject to some general requirements, to FCC substances when necessary to assure functionality.

Food Chemicals Codex III is a comprehensive and well-organized volume that should be included in the library of every food technologist. A great deal of credit is due Durward Dodgen, the FCC III Project Director, and the National Academy of Sciences' Committee responsible for this fine addition to the literature on food additives.

Tree Roots and Buildings

Reviewed by Charles S. Walters, Professor Emeritus, University of Illinois, Urbana, IL; member of ASTM.

REFERENCE: Cutler, D. F. and Richardson, I. B. K., *Tree Roots and Buildings*, Construction Press, Burnt Mill, Essex, England (Longman, Inc., New York), 1981, 94 pp., \$9.95 softcover.

The title of this booklet indicates that trees damage structures

(which they have done) but few data are presented to show what types of damage were observed in the study and what factors contributed to damage—except by inference. In fact, there is some question as to the cause of the damage: tree growth, the heaving of clay soils, or the interaction of tree-root growth and such soils. I know of no similar study published in the United States, although reports of bulging basement walls and cracked floor slabs and side walks have been made.

The text discusses data obtained in the Kew Tree Root Survey, which accumulated information on various species of trees: height, radial root spreads, diameter of roots, and type of soil in which the trees were growing; tree condition, position, and nature of damage; and root spread and distance from building, drive, or wall. Very few of the facts have been presented in an organized fashion. This is unfortunate, since designers of light-frame (low-rise) buildings might wish to know what kinds of damage were observed as a result of tree growth or the heaving of heavy soils or both.

The data presented are for southeastern England. Although the species, soils, and growing conditions are different than those found in the United States, the booklet might be helpful to engineers, architects, or landscape architects if the data on building damage were presented. The book would be of little help to lawyers or expert witnesses in the United States who become involved in property damage litigation.

The authors have suggested one design feature for low-rise buildings to be erected close to existing trees. The solution to the potential problem of damage from tree growth where new trees are to be planted near new buildings appears obvious.

The booklet lists 15 references in the Bibliography. Only one or two of the citations are published in the United States.

The Index includes only references to tree species; however, since "damage" is associated with the maximum tree-to-damage distance for several species, the Index is helpful.